

-15-

CLAIMS

1. A method of controlling frequency use in a virtual single
cell wireless communication network having a plurality of radio heads,
comprising:
authorizing all of said radio heads to selectively use all frequencies in
a spectrum;
communicating between one radio head and a mobile terminal using
one of said frequencies;
determining which of said radio heads will unacceptably interfere with
each radio head;
denying use of a selected frequency by one radio head whenever said
selected frequency is being used by one of said radio heads
which were determined to unacceptably interfere with said one
radio head; and
determining whether said communication with said mobile terminal
should be handed off to another radio head, wherein said
handoff is
a soft handoff if said other radio head is not denied use of said
one frequency, or
a hard handoff if said other radio head is denied use of said one
frequency.

-16-

2. The method of claim 1, wherein said other radio head is not denied use of said one frequency based on use of said one frequency by said one radio head which terminates as a result of handing off said mobile terminal.

3. The method of claim 1, further comprising determining which of said radio heads have unacceptable interference with said mobile terminal, and denying use of said one frequency by said other radio head if still another radio head using said one frequency is determined to have unacceptable interference with said mobile terminal.

4. The method of claim 3, wherein said determining which of said radio heads will have unacceptable interference with said mobile terminal comprises continuously measuring said power of said mobile terminal signal at said other radio heads.

5. The method of claim 1, wherein determining which of said radio heads will unacceptably interfere with each radio head comprises determining attenuation between radio heads based on said geography of said network and layout of said radio heads.

6. The method of claim 1, wherein said determining which of said radio heads will unacceptably interfere with each radio head comprises measuring attenuation between said radio heads and determining whether signals with each radio head will unacceptably interfere with other radio heads when subjected to said determined attenuation between said radio heads.

-17-

7. The method of claim 6, wherein said measuring
attenuation between said radio heads are based on periodic measurements of
signals between said radio heads.

8. A method of handing off communication in a virtual single
cell wireless communication network having a plurality of radio heads each
having a coverage area and adapted to communicate with mobile terminals in
their coverage area, comprising:

authorizing all of said radio heads to selectively use all frequencies in
a spectrum;

determining which of said radio heads will unacceptably interfere with
each radio head; and

handing off a mobile terminal communicating on a first frequency with
one radio head when said mobile terminal moves to said
coverage area of another radio head by performing a soft
handoff if none of said radio heads determined to unacceptably
interfere with said other radio head are using said first frequency
and performing a hard handoff if any one of said radio heads
determined to have unacceptable interference with said other
radio head is using said first frequency.

-18-

2 9. The method of claim 8, further comprising denying use of
a selected frequency by one radio head whenever said selected frequency is
being used by one of said radio heads which were determined to unacceptably
4 interfere with said one radio head.

2 10. The method of claim 8, further comprising determining
which of said radio heads have unacceptable interference with said mobile
terminal, and performing a hard hand off if any one of said radio heads
4 determined to have unacceptable interference with said other radio head or
said mobile terminal is using said first frequency.

2 11. The method of claim 10, wherein said determining which
of said radio heads will have unacceptable interference with said mobile
terminal comprises continuously measuring said power of said mobile terminal
4 signal at said other radio heads and comparing said measured power to a
selected acceptable level.

-19-

12. A virtual single cell wireless communication network for
communicating with mobile terminals, comprising:
a plurality of spaced radio heads each authorized to use all frequencies
in a spectrum;
a memory storing, for each of said radio heads, an identification of
which of said other radio heads unacceptably interfere with said
each radio head;
a controller:
controlling said frequencies used by said plurality of radio heads
whereby a frequency being used by one radio head is
denied use to radio heads unacceptably interfering with
said one radio head, and
controlling handoff of a mobile terminal communicating with a
first radio head on a first frequency to change to
communicate with a second radio head:
by performing a soft handoff if none of said radio heads
stored in said memory as unacceptably interfering
with said second radio head are using said first
frequency, and
by performing a hard handoff if any one of said radio
heads stored in said memory as unacceptably
interfering with said second radio head is using
said first frequency.

-20-

13. The network of claim 12, wherein said memory further
stores periodic samples indicating signal attenuation between said radio
heads, and further comprising a processor using said samples from said
memory to determine which radio heads unacceptably interfere with other radio
heads.

14. A virtual single cell wireless communication network,
comprising:

a plurality of radio heads each authorized to use every frequency in a
spectrum for communicating with a mobile terminal;

a processor identifying unacceptable interference between said radio
heads and between said radio heads and said mobile terminal;

a memory storing information on interference between said radio heads
and information on interference measured between said radio
heads and said mobile terminal; and

a controller

controlling the frequencies used by each radio head,

denying selected radio heads use of a frequency being used by
any radio head and/or mobile terminal identified as having

unacceptable interference with said selected radio heads,
and

-21-

16 controlling handoff of said mobile terminal from a first radio head
 at a first frequency to a second radio head, said controller
18 performing a soft handoff if said radio heads identified as
 having unacceptable interference with said second
20 radio head or said mobile terminal are not using
 said first frequency, and
22 performing a hard handoff if any of said radio heads
 identified as having unacceptable interference with
24 said second radio head or said mobile terminal are
 using said first frequency.

16 controlling handoff of said mobile terminal from a first radio head
 at a first frequency to a second radio head, said controller
18 performing a soft handoff if said radio heads identified as
 having unacceptable interference with said second
20 radio head or said mobile terminal are not using
 said first frequency, and
22 performing a hard handoff if any of said radio heads
 identified as having unacceptable interference with
24 said second radio head or said mobile terminal are
 using said first frequency.